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I HEREBY CERTIFY that annexed hereto is a true copy of the documents filed in connection with the following patent application:

Application No.	S2002/0732
Date of Filing	10/09/2002
Applicant	MARKERITE TRADING LIMITED, an Irish company of Unit 33, Parkwest Enterprise Centre, Parkwest Industrial Estate, Dublin 12, Ireland

Dated this 9 day of September 2003.

An officer authorised by the
Controller of Patents, Designs and Trademarks.

S020732

FORM NO. 1

APPLICATION NO.

REQUEST FOR THE GRANT OF A PATENT
PATENTS ACT, 1992

The Applicant named herein hereby request

— the grant of a patent under Part II of the Act

X the grant of a short-term patent under Part III of the Act

on the basis of the information furnished hereunder.

1. **APPLICANT**

Name	**Markerite Trading Limited**
Address	**Unit 33, Parkwest Enterprise Centre, Parkwest Industrial Estate, Dublin 12, Ireland**
Description/Nationality	**An Irish Company**

2. **TITLE OF INVENTION**

"Measuring Apparatus"

3. **DECLARATION OF PRIORITY ON BASIS OF PREVIOUSLY FILED APPLICATION FOR SAME INVENTION (SECTIONS 25 & 26)**

Previous filing date	Country in or for which filed	Filing No.

4. **IDENTIFICATION OF INVENTOR(S)**
Name(s) of person(s) believed by Applicant(s) to be the inventor(s)
1. WEBB, Andrew
2. MEAGOR, Michael

Address
1. 137 Seafield Court, Killiney County Dublin, Ireland
2. 33 Woodbine Drive, Raheny, Dublin 5, Ireland

5. **STATEMENT OF RIGHT TO BE GRANTED A PATENT (SECTION 17(2)(B))**

By virtue of a Deed of Assignment having effect from September 9, 2002

Contd./...

6. **ITEMS ACCOMPANYING THIS REQUEST - TICK AS APPROPRIATE**

(i) X prescribed filing fee (€60.00)

(ii) _ specification containing a description and claims

X specification containing a description only

X Drawings referred to in description or claims

(iii) _ An abstract

(iv) _ Copy of previous application(s) whose priority is claimed

(v) _ Translation of previous application whose priority is claimed

(vi) _ Authorisation of Agent (this may be given at 8 below if this Request is signed by the Applicant(s))

7. **DIVISIONAL APPLICATION**

The following information is applicable to the present application which is made under Section 24 -

Earlier Application No:
Filing Date:

8. **AGENT**

The following is authorised to act as agent in all proceedings connected with the obtaining of a Patent to which this request relates and in relation to any patent granted -

Name
F. R. KELLY & CO.

Address
at their address as recorded for the time being in the Register of Patent Agents

9. **ADDRESS FOR SERVICE (IF DIFFERENT FROM THAT AT 8)**

MARKERITE TRADING LIMITED
F. R. KELLY & CO.

By:
EXECUTIVE

Date: September 10, 2002

Measuring Apparatus

The present invention relates to a measuring apparatus.

In the field of constructing partially pre-fabricated buildings such as conservatories, it is known to first dig a foundation trench conforming generally to the outline of the building. A foundation wall or footings on which the pre-fabricated components of the building are to be located is then constructed (usually in brick) within the trench. In general most such buildings are designed specifically for the site on which they are constructed, and the individual pre-fabricated components will be produced specifically for the building. To reduce the overall completion time for such buildings it is desireable to be able to carry out the foundation work on site while the pre-fabricated components are produced in a factory. If this is to be done, it is critical that the foundation brickwork conforms closely to the final structure of the pre-fabricated portion of the building.

Referring now to Figure 1, there is shown a trench 10 for a partially pre-fabricated building. The difficulty in laying out the path of the foundation brickwork within the trench is that, if one takes a datum point at some point within the trench, this will not be accessible to all measurement points M1...M4 within the trench. Alternatively, if one takes a datum point D0 on say the external wall of a building to which the pre-fabricated building is to be added, there is a difficulty in obtaining a true measurement from this point to all the required measurement points within the trench which again may not be accessible from the datum point.

According to a first aspect of the present invention there is provided a measuring apparatus comprising a handle, a pendulum pivotally mounted within said handle and extending therefrom, said pendulum being arranged to retain a marker at its free end, and at least one tape holder attached to said handle, said tape holder being arranged to retain a tape which is extendible therefrom.

In the present specification, the term tape is used to mean an elongate, flexible member capable of being wound. Such a tape may comprise a flat, curved, circular or any other suitable cross-section. The tape need not include human readable indicia and may alternatively be electronically readable to produce a measurement.

Preferably, said at least one tape holder is pivotally attached to said handle for rotation about a longitudinal axis of said pendulum marker when in a vertical state.

Preferably, said measuring apparatus includes two tape holders.

Preferably, said pendulum comprises a plurality of telescopic sections so that the distance from said marker to the fulcrum of said pendulum can be adjusted.

Preferably, said pendulum comprises a plurality of sections which can be assembled in use.

According to a second aspect of the invention there is provided a measuring kit comprising a measuring apparatus according to a first aspect of the invention and a plurality of wall brackets, said wall brackets being arranged to receive

the free end of a tape extending from said measuring apparatus.

Embodiments of the invention will now be described, by way of example, with reference to the accompanying drawings, in which:

Figure 1 shows a view of a foundation trench for a partially pre-fabricated building;

Figure 2 is a pictorial view of a measuring apparatus according to a preferred embodiment of the invention;

Figure 3 is a cut-away view of a handle for the measuring apparatus of Figure 2;

Figure 4 is a detailed pictorial view of the handle of the measuring apparatus of Figure 2;

Figure 5 is a cut-away view of a tape-holder for the measuring apparatus of Figure 2;

Figure 6 is pictorial view of a wall bracket with datum point spigots operable with the measuring apparatus of Figure 2;

Figure 7 is pictorial view of the end of a tape for the measuring apparatus of Figure 2; and

Figure 8 is a plan view of an attachment cooperable with a tape measure for above ground level use.

Referring now to Figure 2 a measuring apparatus 20 according to a preferred embodiment of the present invention comprises a

handle 22 from which an adjustable pendulum drop rod marker 24 depends so that, in rest, the marker tends to lie along a longitudinal axis of the apparatus 20. In the preferred embodiment, the handle comprises a pair of tape holders 26', 26". Each tape holder 26', 26" is pivotally mounted on the handle 22 to rotate about the longitudinal axis of the handle. Each tape holder further includes a manually operable tape lock 28. When the lock 28 is open, a tape 30 within the holder may be extended a required amount. The lock 28 may then be closed to hold the tape extended at the required amount.

Referring now to Figures 3 and 4 where the handle 22 is shown in more detail. The handle 22 includes a two part cylindrical collar 32 having an open lower face 33. The pendulum marker 24 comprises an upper ball piece 34 from which an arm 36" comprising an upper part of the pendulum marker 24 extends. The ball piece 34 is retained within a socket formed when the two parts of the collar 32 are assembled and the arm 36" extends from the open lower face of the collar so allowing the marker 24 to pivot within the handle.

In the preferred embodiment, the marker 24 comprises the upper part 36" extending from the handle 22 and a separate three-section telescopic lower part 36', Figure 2. The free end of the upper part 36" is threaded and screws into a threaded socket 37 in the lower part 36'. At the opposite end of the lower part 36', a weighted marker 39 retains a marking tip which can comprise, for example, a scribe point, chalk, a drill bit or a nail (not shown). This two-part arm arrangement enables the apparatus to be more compactly stored and transported while the telescopic part 36' allows the distance from the marking tip to the centre of the ball piece 34 to be adjusted.

The remainder of the handle 22 is generally planar and includes two grip portions 40,42. The lower grip portion 40 is disposed adjacent the collar 32 and the upper grip portion 42 extends from the lower grip portion to be generally disposed over the collar 32. When the end of a tape 30 extending from the holders 26', 26" is retained, pulling on the lower grip portion 40 will tend to tighten the tape, whereas the upper grip portion 42 can be held so as to maintain the handle generally upright.

Referring back to Figure 3, the collar 32 comprises an upper and lower seat 44, 46 around which respective tape holders 26', 26" are located. The seats 44, 46 are divided by a hub 47 of wider diameter than the seats. Each part of the collar 32 includes a pair of channels 49 formed diametrically opposite one another in the hub 47 and which lie in register when the collar is assembled. A pair of screws (not shown) or other suitable mechanism are then passed through the hub channels 49 to fix the collar together around the ball piece 34 of the pendulum marker 24.

Referring to Figure 5, in the preferred embodiment, each tape holder 26', 26" comprises a two part housing 50 (only one shown). The main portion 47 of the housing 50 is generally circular. In at least one part 50 a hub 61 extends from the centre of the main portion 47 and the tape 30 is wound around the hub 61. Preferably, the tape is spring loaded on the hub 61, causing it to retract if the tape lock is open and the tape is not being held. Where the tape is not spring loaded, the hub 61 can be rotably mounted in and extend through the side wall of the housing where a crank (not shown) can be attached to the hub to allow for manual re-winding of the

tape. In a further alternative, the hub 61 could again be rotably mounted and motor driven with the motor being powered by batteries located within the housing 50. The choice of retraction mechanism is generally dependent on the length and weight of tape which may need to be retracted. So for very long tapes, spring force alone may not be sufficient to retract the tape and a crank or motor may be required, whereas for shorter tapes using a spring alone allows a simple closed housing to be employed.

In any case, a tape dispensing section 48 extends from one side of the main portion 47 and retains the tape lock 28. The dispensing section 48 further includes a tape exit slot 45 from which the tape 30 extends from the housing 50. The tape lock 28 comprises a shaft 52 which extends from the dispensing section 48 where it is capped by a button 54. The shaft 52 includes a threaded section 56 which is located within a corresponding retaining wall 58 formed within the dispensing section 48. At the internal end of the shaft 52 a tape engaging pad 65 is located. When the button 54 is twisted in one direction, the pad 65 engages the tape 30 to lock it in position and vice versa to free the tape. It will be seen that many variations of tape lock are employable with the invention and the lock shown is for exemplary purposes only.

A ring section 49 extends from the opposite side of the main portion. The two parts of each housing 50 comprising the tape holders 26′, 26″ are fixed together to locate their respective ring portions 49 around the upper and lower seats 44, 46.

As shown in Figure 2, the holder 26′ is mounted about the upper seat 44 with the tape lock 28 disposed upwardly, and the holder 26″ is mounted about the lower seat 46 with the tape

lock 28 disposed downwardly. The tapes 30 extending from the holders 26', 26" radiate about respective planes located equally above and below the centre of rotation of the ball piece 34 within the collar 32. It will be seen that, because of the inverted orientation of the holder 26", the tape 30 is preferably loaded within the housing so that its graduations are visible from above. The tape 30 is also loaded within the housing of the holder 26' so that its graduations are visible from above. (In any case, it will be seen that tapes can be provided with markings on both surfaces.)

Referring now to Figure 6, there is shown a wall bracket 60 cooperable with the measuring apparatus 20. The bracket 60 comprises a rectangular body on which a longitudinal countersunk slot 62 is formed. One short-end of the bracket 60 is stepped to form a reduced depth portion 63. A pair of coaxial spigots 64 having reduced diameter ends project from opposite sides of the reduced depth portion 63. The step edge 66 interface of the reduced depth portion 63 and the main body of the wall bracket 60 lies along the centre line of the spigots 64. A pin 68 projects from the step edge 66.

In use, a pair of wall brackets D0, D1 of the type shown in Figure 6 are screw fixed to a wall of an existing building to which a partially pre-fabricated building is to be erected, Figure 1. The screws are located in the slots 62 so that the separation of the brackets can be set to a required distance. This is measured by locating the end of a conventional tape over the pin 68 of a bracket 60 which has been fixed in position and dragging the tape towards the other bracket. The required distance is set at the step edge 66 of the other bracket which is then screw fixed in position.

Figure 7 shows the ends of the tapes 30. A tab 70 is fastened to the end of the tape. The tab 70 includes a hole 72 having a diameter suitable for locating the tab over a spigot 64 on a wall bracket 60. It should be noted that the graduations on the tape are calibrated from the centre of the hole 72, so that, with the tape extended, the measurement showing at the exit slot 45 of the tape dispensing section 48 is in fact the distance from the centre of the hole 72 to the centre of the ball piece 34, which in turn corresponds with the longitudinal axis of the arm 36", 36' when in a vertical state.

It should also be noted that the hole 72 lies on the centre line of the tape 30 and that the centre lines of the two tapes held in the housings 26', 26" intersect on the longitudinal axis of the arm 36", 36' when in a vertical state.

The operation of the apparatus of the preferred embodiment will be described in terms of the construction of a conservatory and in relation to Figure 1. When the conservatory is designed, the layout of the foundation brickwork for the conservatory panels is provided to a builder as a set of co-ordinates. The first co-ordinate is the distance between the two wall brackets D0, D1. These are located above ground level and preferably above the eventual level of the foundation brickwork with their spigots 64 the required distance apart. The co-ordinates for each of the measurement points, in this case M1...M4, are then provided as pairs of distances from the respective brackets D0, D1. Thus, for the first measurement point, the distance from D0 can be set on the tape 30 for housing 26' and the distance from D1 can be set on the tape 30 for housing 26". The ends of the respective tapes are located over the spigots 64 of the brackets D0, D1 and the measuring apparatus 20 is pulled away

from the building until both tapes are taut. For marking the outline of the foundations (which need not be very accurate), the length of the arm 36", 36' can be set approximately as the distance from the spigots 64 on which the tapes are located (presumably level with one another) to ground level. The arm is then allowed to settle in a vertical state, the handle is then lowered to the ground and the location of the first measuring point is marked on the ground by the marker 39. The same technique is then employed for each of the remaining measuring points M2...M4 using distances measured from D0 and D1 and the foundation trench is dug accordingly. A concrete foundation is laid in the trench and in the example of Figure 1 this is shown as being level. The length of the arm is then adjusted to the depth of this level beneath the spigots 64 on which the tapes are located. If the trench were not level, then the length of the arm 36", 36' would need to be adjusted for measurement points on different levels. The measurement points M1...M4 can in any case be accurately marked on the concrete foundations using the provided co-ordinates as before.

Preferably, the measurement points M1...M4 and the wall brackets D0, D1 define the corners of the outside face of the foundation brickwork. It will be seen that as this brickwork is built up, it may be desireable to check that these measurement points are correct. As described above, the co-ordinates provided are based on the assumption that the centre of the spigots 64 are co-linear with the centre line of the tapes 30. However, the brickwork may make it impossible to deploy a tape along the original measurement path.

Referring now to Figure 8, there is shown a tape attachment 80. The attachment comprises a sheet having a transverse slot

82 and a hole 84 dimensioned to be located over the spigots 64. The slot 82 can either fit over a tab 74 projecting from the end of the tape 30, Figure 7, or it can accommodate the tab at the end of a conventional tape. Once located on the tape, the centre of the hole 84 is then aligned with the edge of the tape and the correct measurements can be made where the wall might otherwise interfere with the tape.

The preferred embodiment has been described in terms of a generally flat tape 30 having human readable indicia printed thereon enabling an operator to read measurements directly from the surface of the tape. It will be seen, however, that the invention could equally be implemented without using such indicia or indeed a flat tape. For example, the tape could comprise wire of any suitable cross-section and the housing could include electronic circuitry arranged to detect the length of wire dispensed from the housing. This length could then be shown on a digital display located within the housing. The wire itself could include markers which could be read by a sensor to determine the length of wire dispensed. Alternatively movement of the wire could be translated into movement of another member which movement is sensed by the electronic circuitry. So, for example, the wire could be wound once around a second hub located between the hub 61 and tape exit slot 45. Each rotation (or part rotation) of the second hub would correspond with a given length of dispensed wire. (The same would not be true of the hub 61.) Markers would be defined at regular intervals around the circumference of the second hub according to the resolution required. These markers could be of the type that can be optically, electronically or mechanically sensed to determine the degree of rotation of the second hub and so the length of wire dispensed. For such an embodiment, it may be useful to include a reset button or

sensor which is actuated to indicate that the wire has been completely rewound and so the display should be reset in case any slippage or error has occurred.

It should be noted that where a narrow diameter wire is employed as a tape, the problem solved by the tape attachment 80 of Figure 8 may not arise and so a corresponding attachment may not be required in this case.

It will be seen that the invention has been described in terms of a preferred embodiment having two tape measures. The invention, however, could also be implemented with an apparatus including only one tape. In one implementation, the sets of measurements would be as before, and the marker 39 would be used to scribe a series of arcs the required distances from each datum point. Where these arcs intersect then determines the location of the measurement points M1...M4.

Alternatively, a single tape device could be employed with a separate telescopic layout frame (not shown). In this case, the set of co-ordinates provided would again include the distance between the datum points. However, the pairs of co-ordinates provided would include a first distance measured from one datum point and this enables an operator to scribe an arc that distance from the datum point; and a second distance being the distance from the last measurement point. (In this case of the first measured point, it would be assumed that the first measured point extends orthogonally away from the wall on which the datum point is fixed.) This enables the operator to scribe a second arc from the last measurement point using the telescopic layout frame. Where this arc and the arc scribed from the datum point using the measuring apparatus according to this variation intersect defines the next

measuring point. This method, however, assumes that each measuring point is accessible from the last and is most easily performed when the foundation is all on the same level. It should also be seen, however, that this variation may involve accumulating error from one measurement point to the next, rather than in the first embodiment where each measured point is defined independently.

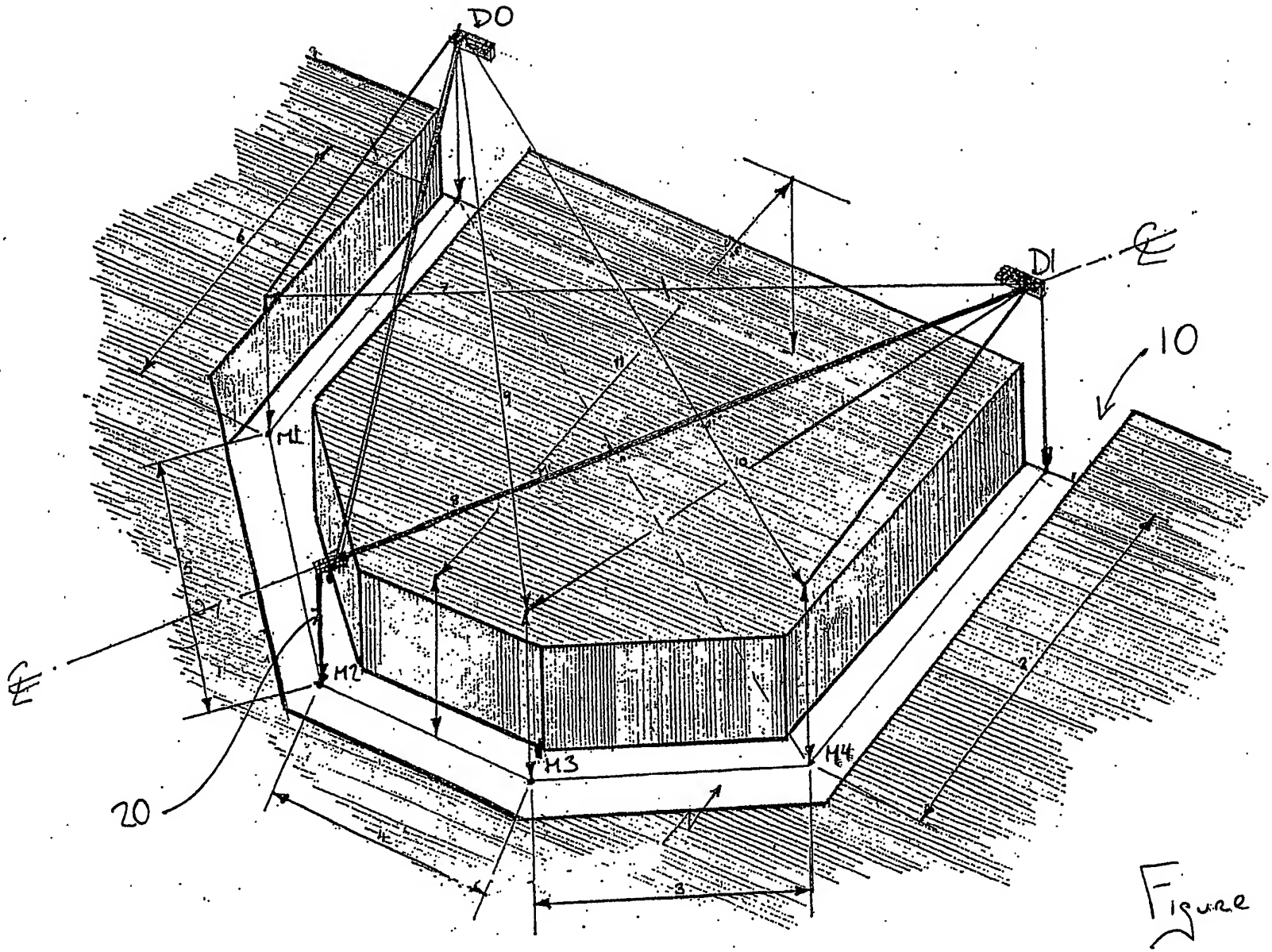

Figure 1

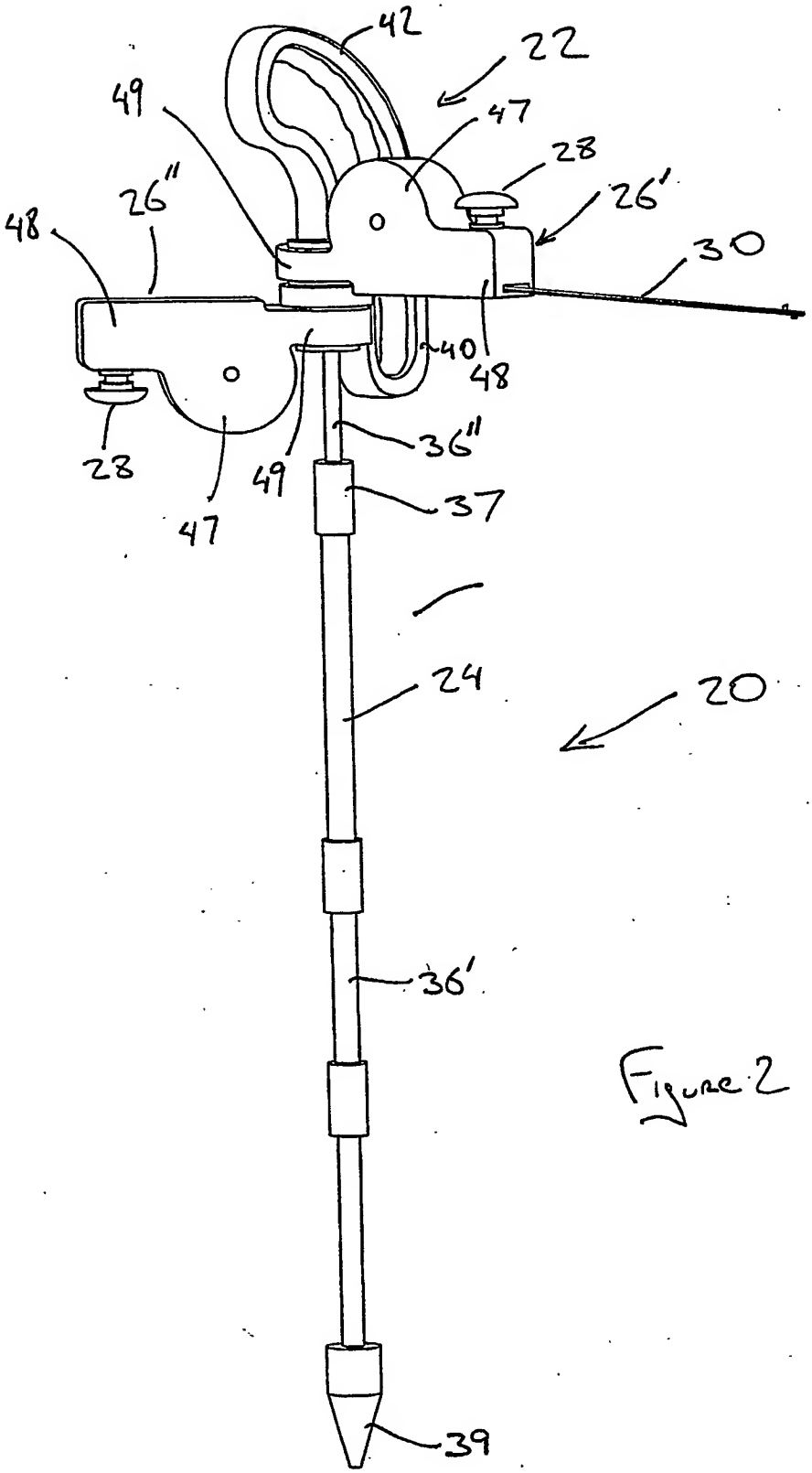

Figure 2

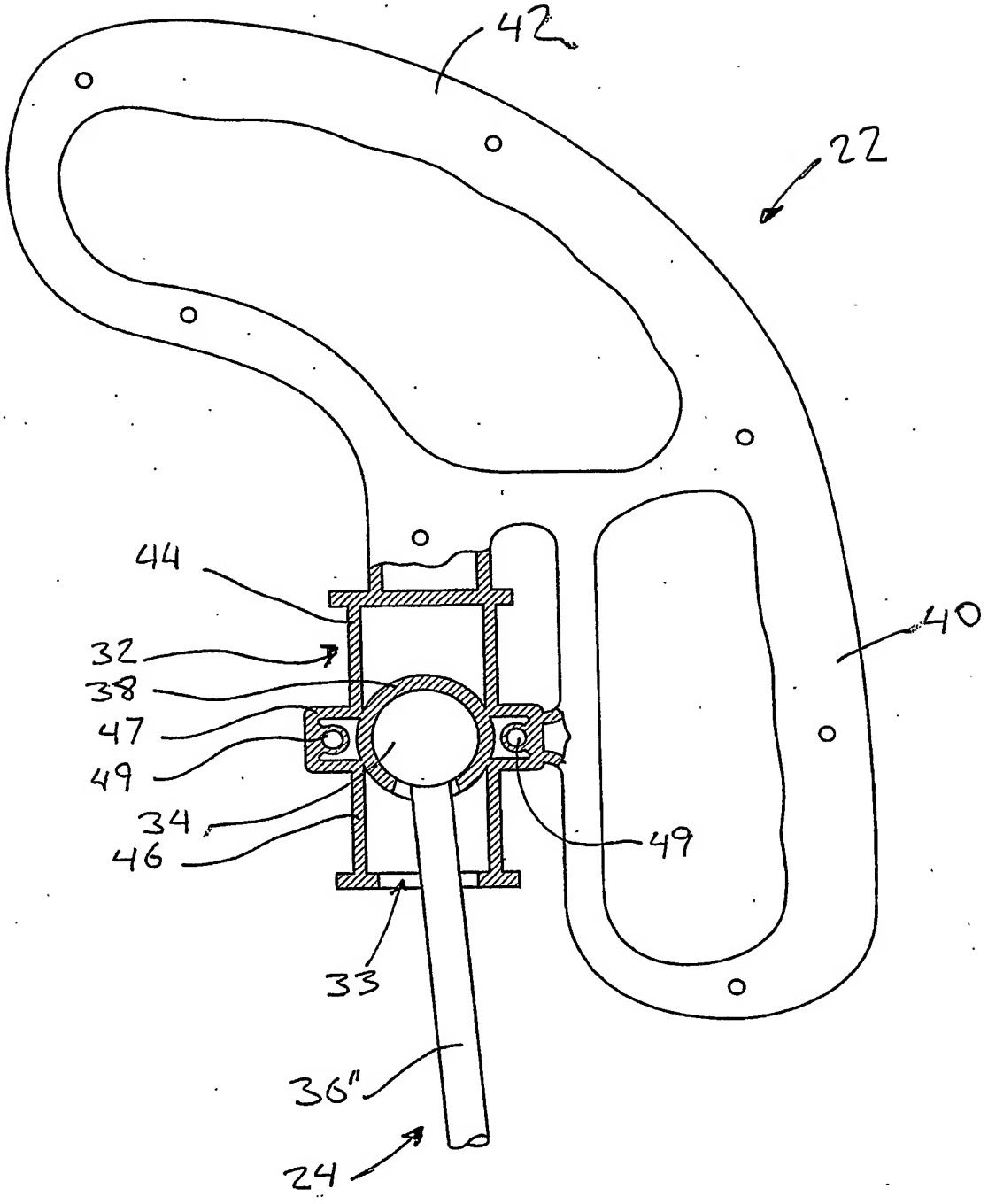

Figure 3

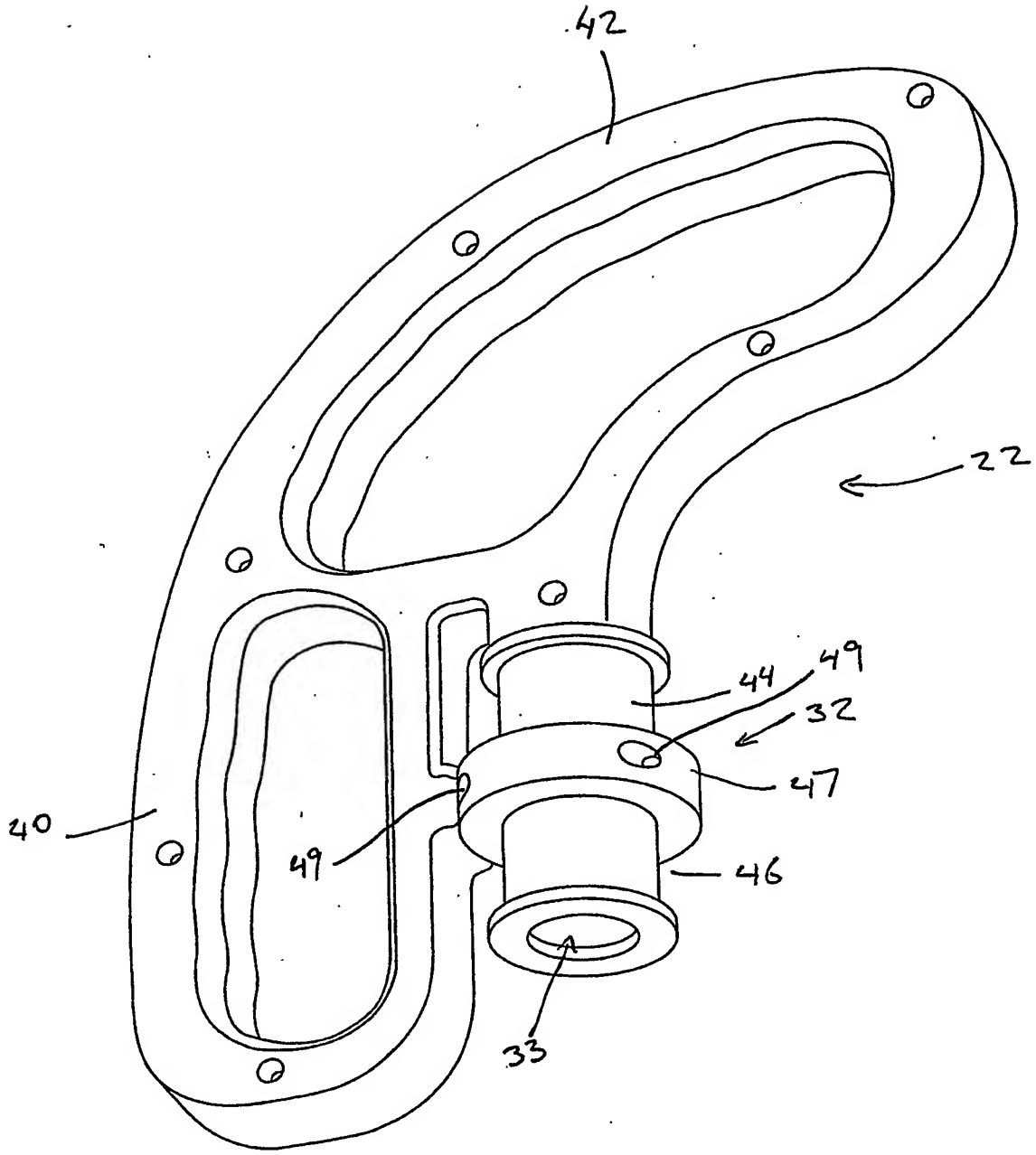

Figure 4

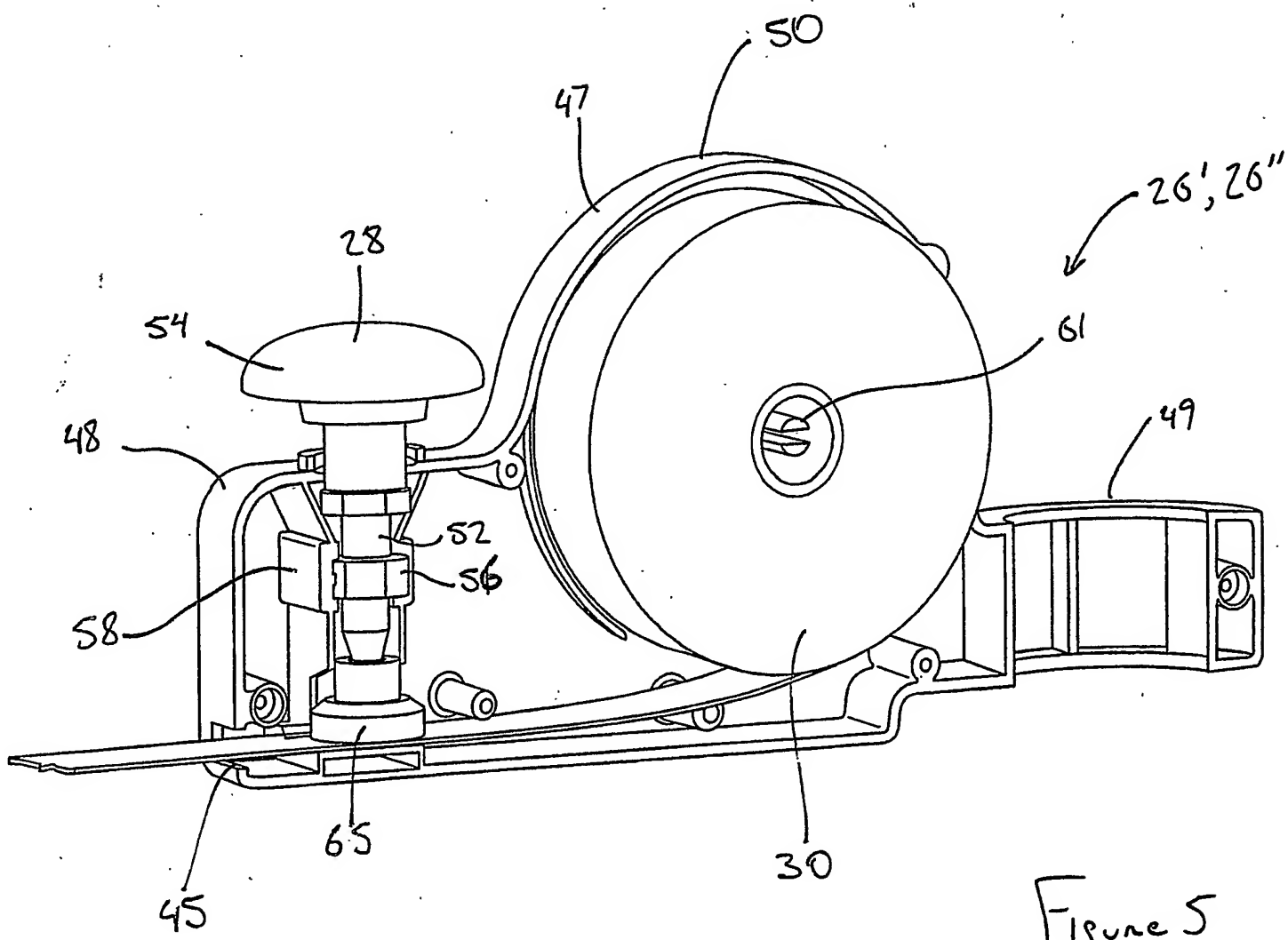

Figure 5

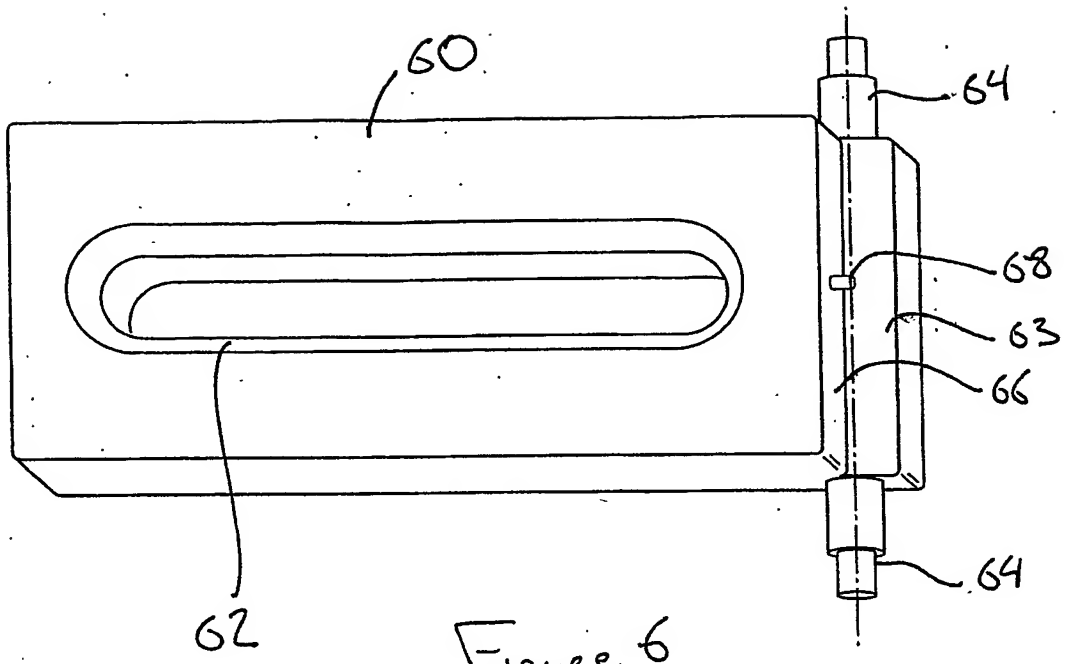

Figure 6

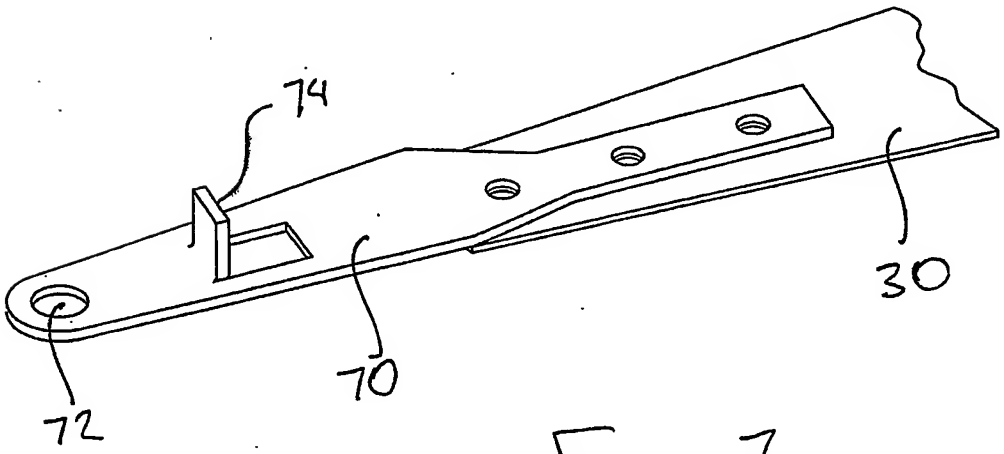

Figure 7

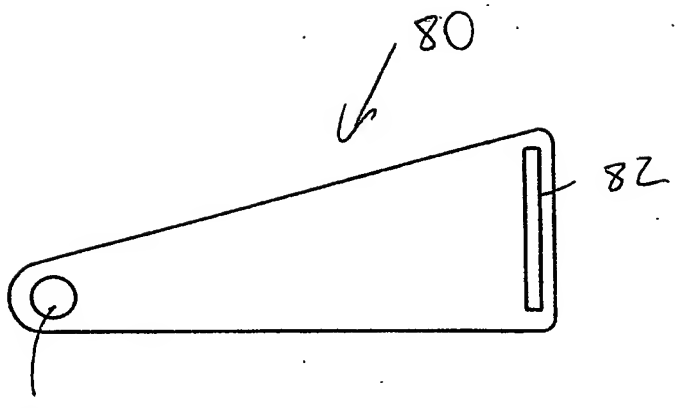

Figure 8